

### **3.3.8.12 Open Bog**

#### **3.3.8.12.1 Community Overview**

Bogs are acidic, low nutrient, northern Wisconsin peatlands dominated by sphagnum mosses that occur in deep layers and accumulate over time as peat. The bog surface is often uneven, with pronounced hummock and hollow microtopography. In northern Wisconsin, bogs are frequently found in the kettle depressions of pitted outwash and morainal landforms. They also frequently occur on the borders of lakes that have low nutrient inputs. Vascular plant diversity is very low in the most acidic sites, but includes characteristic and distinctive specialists such as the narrow-leaved sedge species, cotton-grasses, and ericaceous shrubs, especially leatherleaf, bog laurel, bog rosemary, and small cranberry. Trees are absent or stunted and achieve very low cover values.

In the strictest sense, bogs receive nutrients only from precipitation and limited internal runoff. The thick layers of sphagnum isolate the bog from the influence of nutrient enriched groundwater, and create an environment characterized by high acidity, low oxygen and nutrient levels, and inhabited by a limited number of highly specialized plants that are able to tolerate or thrive in the extreme conditions. Poor fen, open bog, and muskeg often occupy different parts of the same wetland basin, which may include one or more types of lowland coniferous forest as well. Each of these communities responds to slight differences in local site conditions.

#### **3.3.8.12.2 Vertebrate Species of Greatest Conservation Need Associated with Open Bog**

Twenty-six vertebrate Species of Greatest Conservation Need were identified as moderately or significantly associated with open bog (Table 3-201).

**Table 3-201. Vertebrate Species of Greatest Conservation Need that are (or historically were) moderately or significantly associated with open bog communities.**

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**Species Significantly Associated with Open Bog**

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**Birds**  
American Bittern  
Yellow Rail

**Herptiles**  
Four-toed Salamander  
Boreal Chorus Frog  
Mink Frog  
Northern Ribbon Snake  
Eastern Massasauga Rattlesnake

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**Species Moderately Associated with Open Bog**

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**Birds**  
American Black Duck  
Northern Harrier  
Spruce Grouse  
Whooping Crane  
Solitary Sandpiper  
Olive-sided Flycatcher  
Golden-winged Warbler  
Connecticut Warbler  
Henslow's Sparrow  
Le Conte's Sparrow  
Bobolink  
Rusty Blackbird

**Herptiles**  
Pickerel Frog

**Mammals**  
Northern Long-eared Bat  
Silver-haired Bat  
Eastern Red Bat  
Hoary Bat  
Gray Wolf  
Moose

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In order to provide a framework for decision-makers to set priorities for conservation actions, the species identified in Table 3-201 were subject to further analysis. The additional analysis identified the best opportunities, by Ecological Landscape, for protection, restoration, and/or management of both open bog and associated vertebrate Species of Greatest Conservation Need. The steps of this analysis were:

- Each species was examined relative to its probability of occurrence in each of the 16 Ecological Landscapes in Wisconsin. This information was then cross-referenced with the opportunity for protection, restoration, and/or management of open bog in each of the Ecological Landscapes (Tables 3-202 and 3-203).
- Using the analysis described above, a species was further selected if it had both a significant association with open bog and a high probability of occurring in an Ecological Landscape(s) that

represents a major opportunity for protection, restoration and/or management of open bog. These species are shown in Figure 3-50.

**Table 3-202. Vertebrate Species of Greatest Conservation Need that are (or historically were) *significantly* associated with open bog communities and their association with Ecological Landscapes that support open bog.**

Open Bog Ecological Landscape grouped by opportunity for management, protection, and/or restoration of this community type	Birds (2)*		Herptiles (5)				
	American Bittern	Yellow Rail	Four-toed Salamander	Boreal Chorus Frog	Mink Frog	Northern Ribbon Snake	Eastern Massasauga Rattlesnake
<b>MAJOR</b>							
Central Sand Plains	High	Moderate	High				Moderate
North Central Forest	High		High	High	High		
Northern Highland	Moderate	Moderate	High		High		
Northwest Lowlands	High		High	High	High		
Northwest Sands	High	High	Moderate	High	Moderate		
Superior Coastal Plain	High	Moderate	High	High	High		
<b>IMPORTANT</b>							
Central Sand Hills	High	Moderate	Moderate				
Forest Transition	High	Moderate	High				
Northeast Sands	Moderate		Moderate		High		
<b>PRESENT (MINOR)</b>							
Central Lake Michigan Coastal	Moderate		High			High	
Northern Lake Michigan Coastal	Moderate	Moderate	Moderate		High		

**Color Key**  
 = HIGH probability the species occurs in this Ecological Landscape  
 = MODERATE probability the species occurs in this Ecological Landscape  
 = LOW or NO probability the species occurs in this Ecological Landscape

\* The number shown in parentheses is the number of Species of Greatest Conservation Need from a particular taxa group that are included in the table. Taxa groups that are not shown did not have any Species of Greatest Conservation Need that met the criteria necessary for inclusion in this table.

**Table 3-203. Vertebrate Species of Greatest Conservation Need that are (or historically were) *moderately* associated with open bog communities and the ir association with Ecological Landscapes that support open bog.**

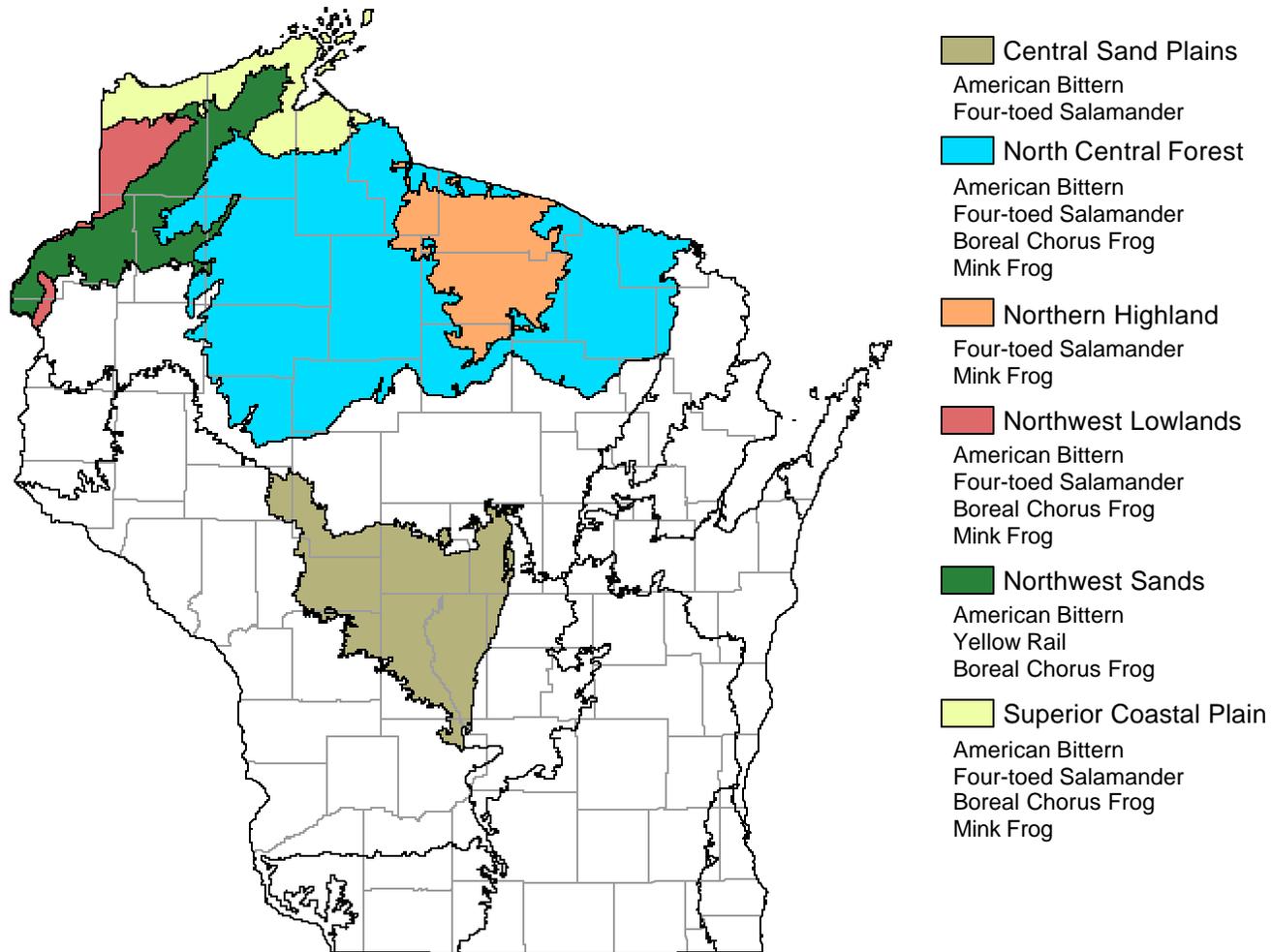
Open Bog Ecological Landscape grouped by opportunity for management, protection, and/or restoration of this community type	Birds (12)*											Herptiles (1)	Mammals (6)						
	American Black Duck	Northern Harrier	Spruce Grouse	Whooping Crane	Solitary Sandpiper	Olive-sided Flycatcher	Golden-winged Warbler	Connecticut Warbler	Henslow's Sparrow	Le Conte's Sparrow	Bobolink	Rusty Blackbird	PickereI Frog	Northern Long-eared Bat	Silver-haired Bat	Eastern Red Bat	Hoary Bat	Gray Wolf	Moose
<b>MAJOR</b>																			
Central Sand Plains		High		High	Moderate		High	Moderate	High	Moderate	High	Moderate		Moderate		Moderate	Moderate	High	
North Central Forest		High	High		Moderate	High	High	Moderate			Moderate	Moderate		Moderate	High		High	High	Moderate
Northern Highland		Moderate			Moderate	High	High	High			Moderate	Moderate		Moderate		Moderate		High	Moderate
Northwest Lowlands		High			Moderate	High	High	High		High	Moderate	Moderate		Moderate		Moderate		High	Moderate
Northwest Sands		High			Moderate	High	High	High		High	Moderate	Moderate		Moderate		Moderate		High	Moderate
Superior Coastal Plain		High			Moderate	High	High	High		High	Moderate	Moderate		Moderate		Moderate		High	Moderate
<b>IMPORTANT</b>																			
Central Sand Hills		High		High	Moderate			High	Moderate	High	Moderate	Moderate		Moderate		Moderate		High	Moderate
Forest Transition		High			Moderate	High	High	High			High	Moderate		Moderate		High		High	Moderate
Northeast Sands		Moderate			Moderate	High	High	High			High	Moderate		Moderate		Moderate		High	Moderate
<b>PRESENT (MINOR)</b>																			
Central Lake Michigan Coastal		High			Moderate	High	High	High			High	Moderate		Moderate		Moderate		High	Moderate
Northern Lake Michigan Coastal		High			Moderate	High	High	High			High	Moderate		Moderate		Moderate		High	Moderate

**Color Key**

- = HIGH probability the species occurs in this Ecological Landscape
- = MODERATE probability the species occurs in this Ecological Landscape
- = LOW or NO probability the species occurs in this Ecological Landscape

\* The number shown in parentheses is the number of Species of Greatest Conservation Need from a particular taxa group that are included in the table. Taxa groups that are not shown did not have any Species of Greatest Conservation Need that met the criteria necessary for inclusion in this table.

**Figure 3-50. Vertebrate Species of Greatest Conservation Need that have *both* a significant association with open bog *and* a high probability of occurring in an Ecological Landscape(s) that represents a major opportunity for protection, restoration and/or management of open bog.**



### **3.3.8.12.3 Threats and Priority Conservation Actions for Open Bog**

#### **3.3.8.12.3.1 Statewide Overview of Threats and Priority Conservation Actions for Open Bog**

The following list of threats and priority conservation actions were identified for open bog in Wisconsin. The threats and priority conservation actions described below apply to all of the Ecological Landscapes in Section 3.3.8.12.3.2 unless otherwise indicated.

##### Threats and Issues

- Changing hydrology by raising or lowering water levels can be detrimental. Nutrient loading, especially when accompanied by hydrologic modifications such as drainage, can totally change the essential character of the community.
- The construction of dams, including beaver dams, may contribute to flooding as well as to the conversion of open bog to marsh habitat, although in some situations (e.g., on a lake shore) the bog mat can float and, within limits, may escape inundation due to a local rise in water level.
- Woody invasion is a problem associated with hydrologic disturbances such as ditching or cutting off the source of water (e.g., by road construction).
- Some problems exist from invasion of nonnative, invasive plants such as purple loosestrife and common reed. Disturbance allows invasive species an opportunity to flourish and should be avoided when possible.
- Motorized recreation in this community contributes to detrimental changes and facilitates the spread of invasive plants.
- Recovery of bog vegetation from damage can be extremely slow.
- Commercial industries such as cranberry growing, 'wild' rice farming, and peat harvesting can impact this community negatively.
- The filling of wetlands associated with residential or other development can permanently damage or destroy an open bog.

##### Priority Conservation Actions

- Maintain large blocks and the quality of other wetlands surrounding or adjoining this community. Manage as complexes of co-occurring peatland communities. Buffer with open habitats on adjacent uplands in appropriate landscapes (e.g., in the Northwest Sands Ecological Landscape).
- Use limited prescribed fire and mechanical treatments to prevent woody invasion as needed.
- Maintain natural hydrologic processes by preventing drainage or flooding.
- Monitor and control invasive species.
- Manage and monitor recreational uses so that they do not harm the environment and cause adverse impacts (i.e., erosion, spread of invasive species, habitat loss).
- Use Best Management Practices and sustainable forest management practices in and around bogs and other peatland habitats.

#### **3.3.8.12.3.2 Additional Considerations for Open Bog by Ecological Landscape**

Special considerations have been identified for those Ecological Landscapes where major or important opportunities for protection, restoration, and/or management of open bog exist. Those considerations are described below and are in addition to the statewide threats and priority conservation actions for open bog found in Section 3.3.8.12.3.1.

Additional Considerations for Open Bog in Ecological Landscapes with **Major** Opportunities for Protection, Restoration, and/or Management

*Central Sand Plains*

Hydrologic changes due to drainage, dike construction, residential development, commercial cranberry operations, and road building have all impacted this community type. The Dewey Marsh in Portage County contains extensive tracts of open bog, poor fen and muskeg within a large, diverse wetland complex on managed and partially protected public land. Other examples of bog habitats occur on the Black River State Forest (Jackson County) and Meadow Valley Wildlife Area (Juneau County).

*North Central Forest*

Boggy habitats are widespread and common in this Ecological Landscape, usually associated with other wetland types. Increased pressure from motorized recreation is causing some impact (i.e., spread of invasive species such as purple loosestrife and phragmites).

*Northern Highland*

There is extensive representation of this community type in this Ecological Landscape, with numerous small and large open bogs and muskegs. The Powell Marsh and the vast peatlands along the Manitowish River (Vilas and Oneida counties), and Thunder Marsh in Oneida County contain good representatives of this and related communities. These three areas are found mostly on public land. Road density in this Ecological Landscape is higher per square mile than in other northern Ecological Landscapes, and has impacted hydrology in several locations. Development adjacent to this community is causing some impacts to hydrology due to wetland filling and road construction. Commercial cranberry operations have altered some of this community. Increased pressure from motorized recreation is causing some impact (i.e., spread of invasive species such as purple loosestrife and phragmites). Best Management Practices and sustainable forest management adjacent to this community should be used.

*Northwest Lowlands*

The open bog complexes are large within this Ecological Landscape. Human populations and road densities are lower within this Ecological Landscape than many other places and have less impacts to this community type. Black Lake Bog, and the Empire and Belden Swamps (all in Douglas County) contain extensive bogs within large wetland complexes that are intact and well preserved. Increased pressure from motorized recreation is causing some impact (i.e., spread of invasive species such as purple loosestrife and phragmites).

*Northwest Sands*

This type is commonly found in the kettle depressions of pitted outwash landforms, often associated with lakes. Human populations and road densities are low but increasing in this Ecological Landscape, especially in the lake districts. Some small but high quality open bogs and poor fens exist and are now protected on the Brule River State Forest. There are some excellent kettle bogs in the Chequamegon-Nicolet National Forest (Douglas and Bayfield Counties).

*Superior Coastal Plain*

A complex ecosystem of open bog (though somewhat limited in size) within a wetland matrix of other peatland communities exists within the Apostle Islands archipelago. Some of this community in the

archipelago is preserved in the National and State Park system and is being affected adversely by recreational uses.

On the mainland, the Kakagon Sloughs on the Bad River Indian Reservation maintains smaller portions of an intricate open bog community in relation to the many quality wetland community types in the area. Though somewhat isolated from other open bog communities, it is well preserved. Sultz Swamp (Bayfield County) is one of the largest acid peatlands (with minimal disturbance) in the Lake Superior basin that contains an open bog community as part of the wetland complex. Though invasive plants may not be a serious problem for this type at the present time, there are scattered invasions of purple loosestrife, phragmites and reed canary grass. These invasives are usually present in areas that have been disturbed in some way.

Additional Considerations for Open Bog in Ecological Landscapes with **Important** Opportunities for Protection, Restoration, and/or Management

*Central Sand Hills*

Hydrologic changes due to residential development and road building are an issue. Agricultural practices adjacent to this community can result in soil erosion and water quality degradation due to sedimentation and nutrient loading.

*Forest Transition*

Smaller open bogs associated with lakes are common. Residential and agricultural developments are concerns, as is habitat fragmentation. The community has been affected by changing site hydrology, wetland filling, and type conversion.

*Northeast Sands*

This community type is usually found in association with smaller lakes in this Ecological Landscape. Population and road density are lower within this Ecological Landscape resulting in fewer impacts to this community. However, motorized recreation is on the increase and may enhance the spread of invasive species such as purple loosestrife. Best Management Practices and sustainable forest management should be used near this community.